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Title: Alternate Automotive Emission Control Systems

#### ABSTRACT

Automotive emission control systems have been developed to meet current and future exhaust emission standards with optimum fuel economy.

The 1973-1974 U.S. vehicle emission standards were easily met with full size 1970 model sedans which were modified by changing combustion chamber, piston head, spark and valve timing, carburetion, and increasing the engine compression ratio. The acceleration performance and city/suburban fuel economy were improved over that of unmodified 1970 cars and were markedly better than comparable 1974 model vehicles.

A 1971, 1.6 liter Pinto was equipped with the Du Pont Total Emission Control System (TECS) and driven 100,000 miles on leaded gasoline. It easily met interim Federal emission standards in effect for California for 1975. This emission control system used exhaust manifold thermal reactors, exhaust gas recirculation (EGR), and carburetor and spark timing modifications to control gaseous emissions. In road tests the Pinto low emission car gave 6 percent better fuel economy than comparable 1973 models which met less stringent emission standards. This low emission vehicle was equipped with a muffler lead trap which reduced the total lead emissions by 84% without deterioration in efficiency over 100,000 miles. This emission control system has been used on standard sized vehicles equipped with V-8 engines with similar results.

Both large and small vehicles have been equipped with catalytic exhaust emission control systems. The fuel economy of these vehicles designed to meet a range of emission standards have been determined. Potential advantages and disadvantages of the various systems with respect to fuel consumption are discussed.